

Upper White River Watershed Restoration Action Strategy

Part II: Concerns and Recommendations

Prepared by

Indiana Department of
Environmental Management
Office of Water Quality

January 2001

Foreword

The First Draft (October 1999) of the Watershed Restoration Action Strategy (WRAS) was reviewed internally by IDEM and revised accordingly. The Second Draft (Spring 2000) was reviewed by stakeholders and revised accordingly. This Third Draft (January 2001) is intended to be a living document to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

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Upper White River Watershed Restoration Action Strategy

Part II: Concerns and Recommendations

Part II of the Watershed Restoration Action Strategy discusses the water quality concerns identified for the Upper White River Watershed and lists recommended management strategies to address these concerns.

Part II includes:

- Section 1 Water Quality Concerns and Priority Issues Identified by Stakeholder Groups
- Section 2 Water Quality Concerns and Priority Issues Identified by State and Federal Agencies
- Section 3 Identification of Impaired Waters
- Section 4 Priority Issues and Recommended Management Strategies
- Section 5 Future Actions and Expectations

1 Water Quality Concerns and Priority Issues Identified by Stakeholder Groups

The Upper White River watershed contains potential stakeholder groups that have different missions. Many of these groups have a long history of working in the Upper White River watershed. The following discussion briefly describes some of the watershed groups and lists their priorities and concerns.

Upper White River Watershed Alliance, Inc.

The Alliance's water quality concerns are fish kills, contaminated drinking water, contaminated groundwater, sedimentation, and fish consumption advisories. The Alliance is also concerned with the impairments of the 34 identified stream segments listed on the "303 (d) list" in the 1998 Indiana Water Quality Report.

A priority issue of the Alliance is to develop a regional water quality monitoring program that is synchronized in terms of methodology, timing and purpose and linked with an integrated regional Geographical Information System (Goode, 2000).

Friends of the White River

The main concerns of the Friends of the White River are combined sewer overflows, habitat removal along the riverbanks, and chemical runoff from agriculture, urban lawns and businesses. The organization is working towards developing a better education system about watersheds and the river ecosystem. They plan on targeting the agricultural and urban populations with different educational materials and more activities.

The organization would like to see:

- more filter strips along the tributaries
- Urban erosion control plans enforced
- Reduction of livestock accessibility into tributaries
- The public view the river as a vital natural resource
- Less dumping and polluting of trash, leaves, etc.
- Access sites to the river

The Friends of the White River is planning to continue and build educational events. They need a staff person to help the organization develop to a higher level (Cowser, 2000).

Eagle Creek Watershed Task Force

The Committee has identified these pollutants as the primary causes that are threatening the water quality in the Eagle Creek watershed:

- Erosion – Major sources are the agricultural cropland and urban construction sites
- Nutrients and pesticides – Sources from agriculture and urban land uses
- Chemicals (oil, hydro-carbons, etc.) – Major source from urban communities and business areas
- Lawn herbicides
- Pathogens - This is the committees biggest concern in the watershed.

In 1997, the Indianapolis Star newspaper wrote articles which reported that Atrazine, an agricultural herbicide used for weed control in corn production, was found in the water of the Eagle Creek Reservoir. The reservoir is a drinking water source for the city of Indianapolis. Since then the water treatment plant now uses a carbon based filtering system to treat the raw water (Dickey, 1999).

The Committee continues to gather more water quality data. A section 319 grant will be used to begin identifying DNA strands in *E. coli* from certain warm blooded animals. The process is called ribo-typing. Human, cattle, sheep, hogs, turkey, poultry, and horse bacteria will be monitored. The results should determine the sources and amounts of bacteria at each monitoring site. Another grant source will fund a macro-invertebrate study in the year 2000.

The Committee through Farm Bureau has also received for a section 319 grant to perform a fish study and further the Eagle Creek watershed Coordinator position in the year 2000.

The Eagle Creek Watershed's Technical Committee is presently working on developing alternatives and implementation strategies for both agricultural and urban land uses (Dickey, 1999).

Local Health Departments

In the Upper White watershed, the county average of new and repaired septic system permits issued ranges from 120 to 480. As urban growth continues, the county health department

workload has become larger than their staffs can properly service (McNulty, 1999; Huffman, 1999; Carr, 1999).

Home or business sites for future septic systems are required to have a soils report. Depending upon the soil type, some of the standard septic systems function properly, while others fail to percolate because of high clay content and/or high water tables. Perimeter drains are installed to lower the water table; however, finding an adequate outlet is often difficult because of all the flat areas in Madison County. The newer installed septic systems in Hamilton County are working better than the older installed systems; however, everything could stand more improvement (McNulty, 1999).

Municipal sewage treatment facilities continue to be constructed throughout many of the growing urban and rural communities of the Upper White watershed. All the county health departments feel this will make a positive improvement in water quality (McNulty, 1999; Carr, 1999; Huffman, 1999).

In Marion County, 17,000 to 20,000 homes still use septic systems. Failure rates for these systems are high and expected to increase as these 20 to 40 year old systems age. The traditional method to extend sewers in Marion County's densely populated neighborhoods is to use the Barrett Law process. Assessment costs to homeowners using this process have ranged from \$8,000 to \$15,000 per "buildable lot." The majority of homeowners strongly object to these costs and 25% of homeowners default on their mortgages in Barrett Law neighborhoods. This process places local officials in an increasingly unpopular position. While understanding the public health importance of extending public sewers, the decision-makers must face the wrath of homeowners who are literally "fighting for their home." An improved way to finance public sewer connection is needed.

Boone County requires that new subdivisions planned within 500 feet of an existing sewage treatment system be connected (Culbertson, 2000).

Bacterial concerns in lakes with surrounding homes that have inadequate septic systems or small lot sizes are a growing problem. One example is Patton Park Lake, an area that was once used seasonally and inhabited with small fishing cabins, has larger homes and permanent residence.

There is an undetermined amount of straight pipe outlets that discharge septic effluent on the soil surface, in road ditches, in drainage field tile, etc. This does not appear to be a significant problem; however, it still is a concern. These systems create a health hazard due to the possibility of spreading disease and are illegal.

There are two ways these illicit discharges get upgraded to county standards.

1. the owner sells the property and must disclose it, and
2. a complaint is filed

Education seems to be an ongoing need. Developing outreach programs would benefit septic system users and help them manage their system (Huffman, 1999).

Soil and Water Conservation Districts

Urban Areas

In many urban areas, one or two ponds are constructed as storm water detention structures to help manage the rainfall runoff from homes, apartments, recreational facilities and parking lots. Over time these ponds develop weed and algae problems. They also accumulate undetermined amounts of fertilizers and lawn and other chemicals that flush out after storm events (Matthieu, 2000).

Urban erosion and off site sedimentation is a major problem in many of the counties of the Upper White watershed. SWCDs feel that the timeliness of enforcement from IDEM for Rule 5 violators is too slow and the penalties (if any) are cheaper to pay than the time spent to install the conservation practices (Venable, 1999; Matthieu, 2000).

Rural Areas

Some counties, like Hamilton and Madison, still have several hundred oil and gas wells that need capping. Uncapped wells provide a direct route to possible ground water contamination. Presently, funding for capping wells are available in some counties.

Sedimentation in the White River and its tributaries is a major concern that has been identified by all the local Soil and Water Conservation Districts, Natural Resource Conservation Service and IDNR Division of Soil Conservation Agencies within the Upper White watershed.

Sedimentation continues to occur in many county drains. Filter strips planted along these county drains would greatly reduce the sediment loads (Heaton, 2000; McClain, 2000).

The Indianapolis Water Company stated that their biggest problem in cleaning up the water is sediment (Matthieu, 2000).

In the western part of the Upper White watershed, wildlife habitat continues to decline because fence rows are being removed and urban growth (McClain, 2000; Douglas, 1999).

More filter strips need to be established along the rivers, streams, and county ditches. Cropland tillage is performed too close to the edge of watercourses creating erosion and sedimentation problems. Buffer strips along the edges of crop fields would also provide some erosion control (Douglas, 1999; Canaday, 1999; Glover, 1999; Hillis 1999; McClain, 2000).

Upper White River Fish Kill

In the middle of December 1999, a contaminant entered the White River causing a fish kill which stretched for more than 50 miles. The approximate area started at the community of Anderson and reached the city of Indianapolis. As of January 6, 2000, the Indiana Department of Environmental Management found no contamination or dead fish south of Marion County.

The investigation and subsequent actions resulting from the contamination and fish kill are still underway. The incident has sparked wide-spread concern about the health of the Upper White River. Local stakeholder groups have been and continue to be integral in restoring the Upper

White River system. The Upper White River Alliance and the Friends of the White River organizations feel that some positive public involvement resulting from the incident may develop and help restore and protect the river in the future (Goode, 2000; Cowser, 2000).

2 Water Quality Concerns and Priority Issues Identified by State and Federal Agencies

This section presents the combined efforts of state and federal agencies, and universities (such as IDEM, IDNR, USDA-Natural Resources Conservation Service, Ohio River Valley Water Sanitation Commission, Purdue University, Indiana University, Indiana Geologic Survey, and US Geological Survey) to assess water quality concerns and priority issues in The Upper White River Watershed. This multi-organization effort formed the basis of the Unified Watershed Assessment for Indiana. At this time, the Unified Watershed Assessment has been completed for 1998 and 2000-2001, as described below.

Indiana's 1998 Unified Watershed Assessment (UWA)

The UWA workgroup gathered a wide range of water quality data that could be used to characterize Indiana's water resources. These data were used in 'layers' in order to sort the 8-digit HUC watersheds according to the present condition of the water in lakes, rivers, and streams. The workgroup used only those data which concerned the water column, organisms living in the water, or the suitability of the water for supporting aquatic ecosystems. Each 'layer' of information/data was partitioned by percentiles into scores. The scores ranged between one and five, with a score of one indicative of good water quality or minimum impairment, and a score of five indicating heavily impacted or degraded water quality. The scoring derived through the UWA process is presented in Table 2-1.

The data layers listed in Table 2-1 can be defined as:

- ◆ Lake Fishery: Large mouth bass community information for lakes
- ◆ Stream Fishery: Small mouth bass community information for streams
- ◆ Aquatic Life Use Support: The 'livability' of the water column for aquatic life, determined from evaluation of chemical and physical water data, and assessment of aquatic life
- ◆ Fish Consumption Advisories: Site specific advisories based on current data
- ◆ Fish Index of Biotic Integrity: Based on fish community diversity and fish health
- ◆ Qualitative Habitat Evaluation Index: Measure of whether the aquatic habitat is suitable for diverse communities, based on visual observations
- ◆ Lake Trophic Scores: Indicator for the rate at which a lake is 'aging' due to inputs of nutrients and other factors
- ◆ Sediment Potential: Indicator of potential sediment input to waterbodies in the watershed

The sources and additional information for these data layers include:

- ◆ Lake Fishery: From IDNR fisheries surveys of lakes and reservoirs from 1972 to 1994. Raw scores were averaged for all lakes in the watershed

- ◆ Stream Fishery: From IDNR fisheries surveys of streams from 1970 to 1994. Raw scores were averaged for all streams in the watershed
- ◆ Aquatic Life Use Support: IDEM, Office of Water Quality, Assessment Branch
- ◆ Fish Consumption Advisories: ISDH and IDEM, Office of Water Quality, Assessment Branch
- ◆ Fish Index of Biotic Integrity: IDEM, Office of Water Quality, Assessment Branch
- ◆ Qualitative Habitat Evaluation Index: IDEM, Office of Water Quality, Assessment Branch
- ◆ Lake Trophic Scores: Indiana Clean Lakes Program through IDEM, Office of Water Quality, Assessment Branch. This score was based on information gathered from sampling conducted in the 1970's and 1980's
- ◆ Sediment Potential: U.S. Geological Survey scored the population rate of change and the 1996 Conservation Tillage Transect data. The scores were then added and normalized to produce a sediment yield indicator for each watershed

TABLE 2-1
RESULTS OF THE UNIFIED WATERSHED ASSESSMENT
FOR UPPER WHITE RIVER

Data/Information Layer	UPPER WHITE RIVER Score
Recreational/Swimming	3
Stream Fishery	2
Aquatic Life Use Support	3
Fish Consumption Advisories	4
Fish Index of Biotic Integrity	3
Qualitative Habitat Evaluation Index	1
Lake Trophic Scores	1
Sediment Potential	5

Note:

The UWA scores range from one to five, with a score of one indicating good water quality and a score of five indicating severe impairment.

Indiana's 2000-2001 Unified Watershed Assessment (UWA)

During summer 1999 the UWA workgroup used additional layers of information to identify the **resource concerns and stressors** for each of the 361 11-digit watersheds in Indiana. Examination of the human activities that have the potential to impact the ecosystem will help

planners to focus on those areas where restoration may be most critical. Organizations can identify opportunities to use their programs and resources to address those areas.

This focusing process will illuminate areas where the interests of two or more partner agencies may converge. It is intended that this will lead to more effective allocation of resources for restoration and protection activities. At the local level, this information can assist groups to prioritize watershed activities and provide some discussion points for planning.

This amended assessment has the following benefits:

- ◆ Provides a logical process for targeting funds, which may be expanded or updated without changing the basic framework.
- ◆ Provides information at a finer resolution (11-digit hydrologic units) to agencies and local groups interested in watershed assessment.
- ◆ Identifies data gaps.
- ◆ Can be used as a compliment to other assessments, such as the 305(b) Report and 303(d) List.

Table 2-2 and Figure 2-1 show the results of the 2000-2001 UWA for the Upper White River watershed.

3 Identification of Impaired Waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with federal technology based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Indiana's 303(d) list was approved by EPA on February 16, 1999.

Once the Section 303(d) list and ranking of waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. The TMDL is an allocation that determines the point and nonpoint source (plus margin of safety) load reductions required in order for the waterbody to meet water quality standards. IDEM's Office of Water Quality has and continues to perform point source waste load allocations for receiving waters. Part I of the WRAS briefly outlines IDEM's strategy for developing TMDLs.

The following Upper White River Watershed waterbodies are on Indiana's 1998 Clean Water Act Section 303(d) list submitted and approved by EPA (Figure 3-1):

Table 3-1
List of Impaired Waterbodies for the Upper White Watershed

Water Body	Location Reach	Parameter(s) of Concern	Severity Ranking
Bean Creek	Indianapolis	E. coli	High
Buck Creek	All	Fish Consumption Advisory for PCB & Mercury; Impaired Biotic Communities	Medium
Cicero Creek	Downstream of Morse Reservoir	E. coli	Low
Dollar Hide Creek	All	Impaired Biotic Communities	Medium
Duck Creek	Elwood to State Rd 213	E. coli	Low
East Fork of White Lick Creek	Headwaters to U.S. 40	Impaired Biotic Communities	Medium
East Fork of White Lick Creek	All	Fish Consumption Advisory for PCB	Medium
Eagle Creek	Indianapolis	E. coli	High
Fall Creek	All	Fish Consumption Advisory for PCB & Mercury	Medium
Fall Creek	Emerson Ave. in Indianapolis to West Fork of White River	E. coli	High
Geist Reservoir	All	Fish Consumption Advisory for Mercury	Low
Indian Creek	All	E. coli	Low
Indianapolis Waterway Canal	Indianapolis	E. coli	High
Killbuck Creek	All	Fish Consumption Advisory for PCB & Mercury; E. coli	Medium
Little Cicero Creek	All	Impaired Biotic Communities	Medium
Mars Ditch	All	Cyanide; pH	High
Morse Reservoir	All	Fish Consumption Advisory for Mercury	Low
Pipe Creek	All	Fish Consumption Advisory for PCB & Mercury; E coli	Medium
Pleasant Creek	All	E coli	High
Pogues Creek	Indianapolis	E coli	High

Table 3-1
List of Impaired Waterbodies for the Upper White Watershed
(continued)

Water Body	Location Reach	Parameter(s) of Concern	Severity Ranking
South Fork Griffy Creek	All	Impaired Biotic Communities	Medium
State Ditch	All	Cyanide; pH; E. coli	High
Stout Creek	All	Fish Consumption Advisory for PCB & Mercury	Medium
West Fork White River	Fall Creek to Pleasant Run	Fish Consumption Advisory for PCB & Mercury; E. coli; Dissolved Oxygen; Ammonia	High
West Fork White River	Indianapolis from Pleasant Run to Little Buck Creek	Fish Consumption Advisory for PCB & Mercury; Cyanide; Dissolve Oxygen; E. coli; Impaired Biotic Communities	High
West Fork White River	Crooked Creek to Fall Creek	Fish Consumption Advisory for PCB & Mercury	High
West Fork White River	Cicero Creek to Crooked Creek	Fish Consumption Advisory for PCB & Mercury; Impaired Biotic Communities	Medium
West Fork White River	White Lick Creek to Beanblossom	Fish Consumption Advisory for PCB & Mercury; Cyanide; E. coli; Impaired Biotic Communities	Medium
West Fork White River	Hamilton	Fish Consumption Advisory for PCB & Mercury; E. coli; Impaired Biotic Communities	High
West Fork White River	Little Buck Creek to White Lick Creek	Fish Consumption Advisory for PCB & Mercury; Cyanide; Impaired Biotic Communities	High
West Fork White River	Madison County	Fish Consumption Advisory for PCB; E coli; Impaired Biotic Communities	Medium
West Fork White River	Muncie to Madison County	Fish Consumption Advisory for PCB & Mercury; E. coli	Medium
West Fork White River	All	Fish Consumption Advisory for PCB & Mercury	Medium
West Fork White River	Headwaters to Muncie	Fish Consumption Advisory for PCB & Mercury; Impaired Biotic Communities	Medium
White Lick Creek	All	Fish Consumption Advisory for PCB & Mercury	Medium

Notes:

Severity Ranking - High: Waters with acute criteria violations of state water quality standards for toxic substances or ammonia; a group 5 (do not eat any fish) fish consumption advisory for PCBs or mercury; scores of very poor or less based on biological assessments; and waters used or potentially used extensively for whole body contact recreation where potential sources of E. coli are identifiable.

Severity Ranking - Medium: Waters with chronic criteria violations of state water quality standards for toxic substances, ammonia or dissolved oxygen; waters threatened or scoring poor on biological assessments; and waters which had group 3 or 4 fish consumption advisories for mercury or group 2,3, or 4 for PCBs.

Severity Ranking - Low: Waters with violations of state water quality standards for pH, chlorides, etc.; waters with group 2 or 3 fish consumption advisories for mercury; and waters with E. coli violations that have limited potential for whole body contact recreation.

4 Priority Issues and Recommended Management Strategies

Part I provided the existing water quality information for the Upper White River watershed and Part II lists priority issues and concerns from local, state, and federal stakeholders in the watershed. This section pulls together the priority issues and concerns held by all stakeholders and recommends management strategies. Underlying all discussions of priority issues and concerns is the fact that improving water quality in the Upper White River Watershed will also enhance the natural and recreational values of Upper White River. Each subsection below focuses on a single priority issue.

4.1 Planning Process and Plan Development

Many organized watershed groups or committees have difficulty developing watershed plans. Sometimes groups or committees try too hard to produce a document that is "perfect" or "complete." However, new information will always be available so the watershed plan will be a living document, updated periodically. The "process of involving and informing" the watershed community will determine the success of a watershed project. The talent and resources in a watershed community are invaluable. The planning process involves visioning, team building activities, goal setting, etc., as well as data inventory, implementation and monitoring. It is a constant evaluation that should be reviewed from the beginning, middle and end.

Recommended Management Strategy 1: Read and reference the documents, "Watershed Action Guide for Indiana" and "What Needs to be in a Watershed Management Plan" supplement (Obtain copies from IDEM, Office of Watershed Management). Leadership committees or groups should reference them at all stages of the watershed project.

Recommended Management Strategy 2: Use existing data, develop a plan of work, target areas, find funding sources, etc., and begin developing a watershed plan. Contact local, state and federal agencies that provide assistance in plan development.

4.2 Data\Information and Targeting

As in many of the watersheds in Indiana, there is a need for more water quality data and information in order to prioritize and target specific areas of the Upper White watershed. In addition to targeting areas, there is also an identified need for more data and information about

the actual impact on water quality from nonpoint sources. Success in restoring water quality in the Upper White watershed is fundamentally based on identifying the specific geographic problem areas; identifying all sources contributing to the impairment of the waterbody; and quantifying the contribution of a pollutant by each source.

Recommended Management Strategy 1: Local SWCDs, natural resource agencies, cooperative county extension services, and other interested personnel need to gather and analyze existing water quality data, natural resource information and other information pertinent to the area. Communication and the sharing of this data and information should be provided at a meeting sponsored by the Soil and Water Conservation Districts or a interested group.

Recommended Management Strategy 2: Once all the information and data is shared, a “plan of work” should be developed. The “plan of work” basically outlines what direction the local stakeholders will take involving more stakeholders, obtaining additional information, formulating committee(s), setting time frames of events, etc.

Recommended Management Strategy 3: Inform the public about the past, present, and future desired condition of the watershed or watershed areas that will be improved upon. If possible run a series of articles or radio updates about each assessed tributary of the watershed. Present the findings whether an impairments exists or not. This will help build community support if a project is further developed. Document your findings and decisions.

Recommended Management Strategy 4: Target and prioritize watershed areas that are creating possible impairments to a waterbody. Targeting and prioritization should be managed at the 11 or 14 digit HUC watershed area (Figure 2-2 of Part I). The targeting and prioritization will require input from stakeholders living in those geographic areas. The purpose of this prioritization and targeting is to enhance allocation of resources in the effort of improving water quality.

Recommended Management Strategy 5: Encourage the public to participate in water quality monitoring. Stream and macroinvertebrate assessments are good measures of progress.

4.3 Failing Septic Systems and Straight Pipe Discharges

Local county health departments and other stakeholders have identified failing septic systems and straight pipe discharge from septic tanks as sources of water pollution in the Upper White watershed. Straight pipe discharges from septic tanks and septic tanks connected to drainage tiles are illegal (327 IAC 5-1-1.5); however, these practices are ongoing in the Upper White watershed.

Recommended Management Strategy: All of the County Health Departments have stressed that more education is needed pertaining to septic system management. Providing demonstrations, field days, or workshops for the public in order to provide more information on the impacts of failed septic systems, regulations, alternative treatment systems, and financial assistance may be a good start. Local stakeholders could partner to help share in the cost of this program. To further these educational efforts, the direct impact of communities discharging their septic tank effluent to waterbodies needs to be adequately characterized. This

will involve coordination between the County Health Departments, the Indiana State Department of Health, and other stakeholders. The option of choice to eliminate the illegal discharges will be a cooperative effort between homeowners and local, state, and federal stakeholders. If a cooperative solution can not be reached, illicit dischargers will be required to cease discharge.

4.4 Water Quality - General

The Clean Water Act Section 303(d) list presented in Section 3 lists water quality limited waterbodies for the Upper White watershed.

Recommended Management Strategy: The Clean Water Act requires states to complete TMDLs for waterbodies listed on the Section 303(d) list. The Office of Water Quality is currently evaluating and exploring the modeling process and data needs required to complete TMDLs for the Section 303(d) listed waterbodies in the Upper White watershed. Completion of a TMDL will involve loading allocations of a pollutant to both point and nonpoint sources. The Office of Water Quality is currently drafting a TMDL strategy that involves stakeholder input throughout the process.

4.5 Fish Consumption Advisories

As noted in Part I and Part II, fish consumption advisories are a major concern in the White River and many of its tributaries.

Recommended Management Strategy: Any person eating fish from the White River or any of its tributaries should check the fish consumption advisory every year and follow the recommendations. Soil and Water Conservation Districts could run yearly spring articles about fish consumption recommendations through local media sources or their newsletter.

4.6 Nonpoint Source Pollution - General

Nonpoint source pollution contributions are often difficult to assess or quantify. Currently, loadings of nonpoint source pollutants to water are often inferred by examination of land use practices, without actual measurements. In addition, the actual water quality impairments related to nonpoint source pollutants have not been well characterized in the Upper White watershed. Finally, very few regulatory control mechanisms exist to control nonpoint source pollution.

Recommended Management Strategy: Numerous funding mechanisms, such as Conservation Reserve Program, Environmental Quality Incentive Program, Lake and River Enhancement program, and 319(h) grants, exist to promote practices to reduce nonpoint source pollution in the watershed. The prioritization and targeting discussed previously in Part II should be used to allocate further application of resources.

4.7 Point Sources - General

During the 1998 Intensive Sampling by the Office of Water Quality, several permitted dischargers were found to be discharging in excess of their permit limits. In addition, illicit point source discharges, such as tiles discharging septic tank effluent, exist in the watershed.

Recommended Management Strategy: The Permitting and Compliance Branch of the Office of Water Quality is responsible for issuing and monitoring compliance of NPDES permit holders. Clearly, more emphasis and resources are needed to identify and correct illicit and noncomplying point sources. Improving compliance of NPDES dischargers and identifying illicit dischargers will involve fostering a working relationship with other local, state, and federal stakeholders to monitor compliance and report unusual discharges or stream appearance. In regards to illicit discharges, the Office of Water Quality will work with local, state, and federal stakeholders to identify and eliminate these sources of water pollution.

5 Future Expectations and Actions

As discussed in Part I, this Watershed Restoration Action Strategy is intended to be fluid document that will be revised or amended as new information becomes available. Section 5.1 discusses expectations derived from the Strategy and how progress will be measured. Specific revisions and amendments to the Watershed Restoration Action Strategy are discussed in Section 5.2. Finally, the Watershed Restoration Action Strategy will be reviewed by all stakeholders before it becomes final, as described in Section 5.3.

5.1 Expectations and Measuring Progress

The Upper White River Strategy provides a starting point to address water quality concerns held by local, state, and federal stakeholders. Part II provides recommended management strategies to address these concerns. Through cooperative efforts with stakeholders, all of the recommended management strategies listed will begin implementation by the summer of 2000.

Measurement of progress is critical to the success of any plan. Water quality improvements will not take place overnight. Measuring of progress in terms of water quality will be provided through the Office of Water Quality Assessment Branch's rotating basin monitoring strategy. Specifically, they will be conducting sampling again in 2001. This will allow an assessment of progress in improving water quality.

5.2 Expected Revisions and Amendments

This Watershed Restoration Action Strategy is intended to provide a starting point to improve water quality and measure the improvement. Hence, this document will require revisions and amendments as new information becomes available. The future revisions and amendments have been divided into those that are expected within the next year (Section 5.2.1) and those that will occur over a long-term basis (Section 5.2.2).

5.2.1 Short Term Revisions and Amendments

The most significant revisions and amendments will likely occur during 2001 and after, as a result of the rotating basin assessments to be completed during 2001. The Section 305(b) assessments will be completed by late 1999 or early 2000. Local, state, and federal stakeholder comments regarding the Watershed Restoration Action Strategy will be addressed in future revisions of the document.

5.2.2 Long Term Revisions and Amendments

The Office of Water Quality is moving toward adopting a watershed management approach to solve water quality problems. Part of the watershed approach is the use of a rotating basin management cycle. The Assessment Branch of the Office of Water Quality has already adopted this rotating basin cycle in its intensive monitoring and assessment of Indiana waterbodies (this is in addition to the already established fixed monitoring station monitoring which occurs on a monthly basis). Based on the cycle the Assessment Branch is using, the next intensive monitoring of the Upper White River watershed will occur during the sampling season of 2001. The information from the 2001 monitoring effort will be incorporated into the Watershed Restoration Action Strategy.

In addition, the Watershed Restoration Action Strategy may be revised or amended prior to 2001, if sufficient information becomes available.

5.3 Review of the Watershed Restoration Action Strategy

Before this Watershed Restoration Action Strategy becomes final, it will undergo rigorous review. The first stage of review will be performed internally by the Office of Water Quality. Once the Watershed Restoration Action Strategy has been revised to address internal Office of Water Quality comments, it will be circulated to local, state, and federal stakeholders in the watershed and meetings within the watershed will be held to discuss the document. Written comments from local, state, and federal stakeholders will be addressed and the Watershed Restoration Action Strategy will again be revised to incorporate applicable comments. Once internal and external comments have been addressed, the final version of the Watershed Restoration Action Strategy will be released.

Table 2-2

HYDROLOGIC UNIT SCORES for Each Parameter Used in the Unified Watershed Assessment [2000-2001]																
11 Digit Hydrologic Unit		Mussel Diversity and Occurrence	Aquatic Life Use Support	Recreational Use Attainment	Stream Fishery	Lake Fishery	Eurasian Milfoil Infestation Status	Lake Trophic Status	Critical Biodiversity Resource	Aquifer Vulnerability	Population Using Surface Water for Drinking Water	Residential Septic System Density	Degree of Urbanization	Density of Livestock	% Cropland	Mineral Extraction Activities
Upper White	05120201010	1	3	nd	nd	nd	nd	2	3	4	4	3	2	3	4	2
	05120201020	nd	3	nd	nd	nd	nd	nd	3	3	4	4	2	3	4	2
	05120201030	nd	4	nd	nd	nd	nd	nd	3	2	4	5	2	2	4	2
	05120201040	1	3	1	nd	nd	nd	nd	2	3	4	5	2	2	4	2
	05120201050	nd	4	4	nd	nd	nd	1	2	4	4	4	2	3	5	3
	05120201060	nd	4	3	nd	nd	nd	nd	1	5	4	3	2	3	5	2
	05120201070	nd	3	3	nd	nd	nd	nd	2	2	4	4	2	2	3	2
	05120201080	nd	3	1	1	nd	nd	2	2	5	4	3	2	2	4	2
	05120201090	nd	3	1	nd	nd	nd	nd	3	3	4	5	3	2	1	2
	05120201100	nd	4	1	3	nd	nd	nd	3	2	4	4	2	3	4	2
	05120201110	nd	1	2	3	nd	nd	2	4	2	4	5	3	2	1	2
	05120201120	nd	3	1	3	nd	nd	3	3	4	4	4	3	3	2	2
	05120201130	nd	4	3	nd	nd	nd	nd	2	2	4	5	4	1	1	1
	05120201140	nd	1	1	nd	nd	nd	nd	2	3	4	5	2	2	2	1
	05120201150	nd	3	1	1	nd	nd	nd	2	4	4	5	2	3	3	1
	05120201160	nd	3	4	nd	nd	nd	nd	3	4	4	4	2	2	2	1
	05120201170	nd	3	3	nd	2	nd	2	2	4	4	4	2	2	2	1
	05120201180	nd	nd	nd	nd	nd	nd	nd	3	3	3	3	1	3	2	1

Nd = No data

The UWA scores range from one to five, with a score of one indicating good water quality and a score of five indicating severe impairment.

Figure 2-1

